Rotavirus Type A associated Diarrhoea in Neonatal Piglets: Importance and Biodynamics

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Rotavirus type A associated diarrhoea in neonatal piglets: Importance and biodynamics

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Introduction

Rotavirus A (RVA) is a well-known cause of diarrhoea in neonatal piglets, but the infection dynamics and clinical impact are not fully elucidated. The aim of the project was to determine the significance of infection with RVA in relation to neonatal diarrhoea and to explore appropriate sampling material for confirmation of the infection status in the herds.

Material and methods

Two commercial swine herds with neonatal diarrhea and a positive RVA diagnosis were included. Five litters from each of two herds and a total of 132 piglets were sampled. In addition a floor sock sample was collected in each pen. The animals were subjected to a daily clinical examination and feces was collected daily from all piglets. The piglets were weighed at the beginning and at the end of study. The outbreak day was defined as the day where >25 % of piglets in the litter had diarrhea, and for all litters this was either the 4th or 5th day of life. Fecal samples taken at the outbreak day from all piglets in a litter were analysed for RVA together with samples collected one and two days prior to the outbreak day from 54 of the 132 piglets. The analyses were made by an RVA specific RT-qPCR Pang et al., 2004). Virulent E. coli was ruled out by PCR as differential diagnosis in all litters by testing a pooled fecal sample on the outbreak day.

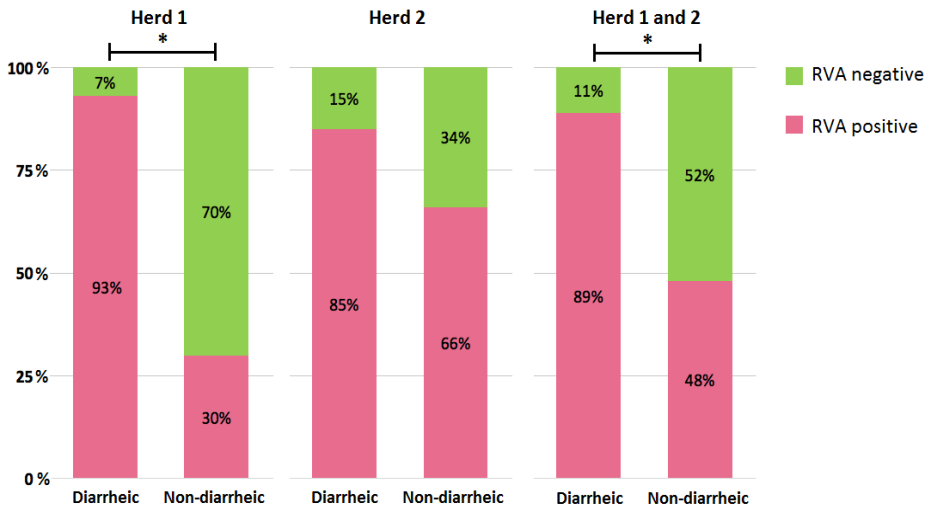

Figure1. Prevalence of RVA in diarrheic and non-diarrheic piglets on the outbreak day for herds 1 and 2 (separately and combined).

Results and discussion

In total, 43% (57/132) of the piglets had diarrhea and 66 % (87/132) were positive for RVA on the outbreak day (Figure 1). For comparison, 89 % (51/57) of the diarrheic piglets and 48 % (36/75) of the non-diarrheic piglets were positive for RVA (Fisher exact test; *P*<0.001). Piglets that tested negative for RVA had a higher weight gain over the 4-day period (mean 363g vs. 278g, Fisher exact test; P<0.05) despite that the RVA-positive piglets had a significantly higher birth weight (mean 1450g vs. 1270g, Fisher exact test; P<0.05). Furthermore, 63 % (34/54) of the piglets developed diarrhea within 24 hours after a positive RVA diagnosis.

Test of pen floor samples on the outbreak day showed a good correlation to the status of the pen in that it tested positive if a RVA-positive pig were present.

The results confirmed that RVA has a significant impact on incidence of diarrhoea and body weight gain in piglets. Furthermore, the results showed that a pen floor sample provides a diagnostic tool for diagnosis of RVA on the herd and/or pen level.

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	Pigs in pen	Day 1	Day 2	Day 3	Day 4
Pen 1	14	0/0	2 / 6	5 / 6	12 / 14
Pen 2	13	0/0	1 / 4	3 / 4	5 / 13
Pen 3	14	0/0	5 / 6	6 / 6	12 / 14
Pen 4	14	0/0	2 / 7	4 / 7	6 / 14
Pen 5	12	0/0	2 / 3	2 / 3	4 / 12
Pen 6	12	0/0	0 / 4	0 / 4	0 / 12
Pen 7	14	0/0	1 / 6	3 / 6	10 / 14
Pen 8	14	1 / 6	6 / 6	14 / 14	0/0
Pen 9	13	0/0	0 / 6	6 / 6	12 / 13
Pen 10	12	0 / 6	3 / 6	12 / 12	0/0
Ratio of RVA positive pen floor samples		**1/8**	**7/10**	**8/10**	**9/10**

Red RVA positive pen floor sample on the given day
Green RVA negative pen floor sample on the given day
Yellow No pen floor sample collected on the given day

Table 1 Results of the pen floor samples for each sampling day. The colour indicates whether the pen floor sample tested RVA positive or RVA negative. The numbers presented in the coloured areas indicate the number of piglet samples that tested RVA positive / the total number of piglets tested on the given day in that pen. The underlined numbers in each line indicates the outbreak day of the pen.